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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/719,303	12/11/2000	Martin Schadt	08130.0058	7024

22852 7590 10/08/2003

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EXAMINER

HON, SOW FUN

ART UNIT	PAPER NUMBER
1772	

DATE MAILED: 10/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

MS

Office Action Summary

Application N .

09/719,303

Applicant(s)

SCHADT ET AL.

Examiner

Sow-Fun Hon

Art Unit

1772

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 26-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

Withdrawn Rejections

1. The 35 U.S.C. 112, 2nd paragraph rejections in Paper # 6 (mailed 01/16/03) have been withdrawn due to Applicant's amendment and affirmation in Paper # 8 (filed 07/15/03) of the broad interpretation of the claims.
2. The 35 U.S.C. 102(b) and 103(a) rejections in Paper # 6 (mailed 01/16/03) have been withdrawn due to Applicant's amendment and clarification in Paper # 8 (filed 07/15/03) that components (i) and (ii) are separate components and that component (i) is not photo-orientable.

New Rejections

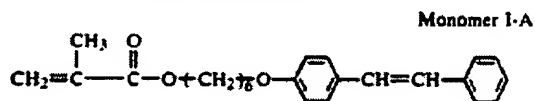
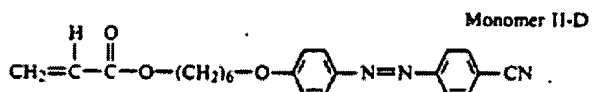
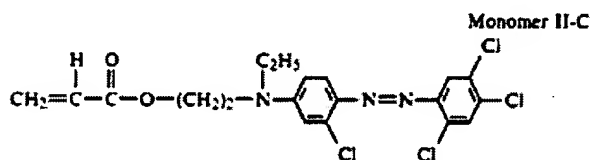
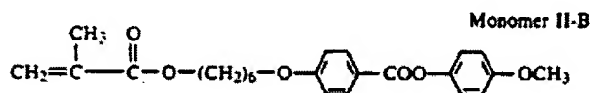
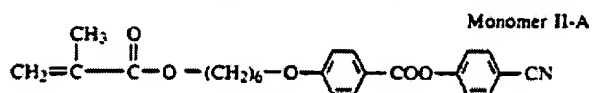
Claim Rejections - 35 USC § 102

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 1-7, 11, 16-17, 19-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Omelis et al. (US 5,098,975).

Omelis et al. has a polymerisable mixture comprising at least the following two components: (i) a liquid crystal monomer having cross-linkable groups (stilbene monomer I-A) and (ii) a photo-orientable monomer (dye monomer II-A) (column 12, lines 55-65). As seen on the next page, the stilbene group is liquid crystalline with the two vinylic double bonds providing the cross-linkable groups in monomer I-A (column 2, lines 35-70), and the azobenzene linking

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group provides the cis-trans isomerizable photo-orientable group for the azo dye monomer (column 6, lines 1-40) which is monomer II-C.

Monomers of Formula I:Monomers of Formula II:

The left segment of monomer II-C has a vinylic acrylate group which makes it linearly photo-polymerisable (column 3, lines 1-60). When component (i) (crosslinkable liquid crystal monomer I-A) is present in the amount of 100 parts by weight (148 g normalized to 100), component (ii) (photo-orientable monomer II-A) is present in the amount of at least 2 parts by weight (2.6 g adjusted with the amount of monomer I-A normalized to 100) and at least 10 parts by weight (26 ml). The mixture is dissolved in a solvent (dioxane) (column 12, lines 55-70). The azo dye molecule makes the film precursor presensitized to light, and is carried by a substrate (column 10, lines 1-5).

The film produced is optically anisotropic (column 1, lines 5-15) and is used for optical components (column 9, lines 60-70).

Claim Rejections – 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Omelis in view of Ichimura et al. (US 5,706,131).

Omelis et al. has been discussed above and teaches an optical film component polymerized from a polymerizable mixture comprising at least the following two components: (i) a liquid crystal monomer having cross-linkable groups and (ii) a photo-orientable monomer containing an azobenzene group.

Omelis et al. fails to teach that the polymerizable mixture is polymerized in a preferred orientation direction in the optical film component.

Ichimura et al. has a polarizer (polarizing element) having photoactive molecules containing at least one double bond selected from non-aromatic (vinyllic) C=C and non-aromatic N=N (column 2, lines 30-70). Irradiation by linear polarized light causes a molecular axis orientation change. Azo dye molecules such as azobenzene are examples of the photoactive molecules (column 4, lines 15-70).

The polarizer is polymerized (baked) with locally varying preferred orientation directions (irradiated with linear polarized lights different in axis of orientation at the time of baking) (column 16, lines 1-20). The polarizer has the additional function of an orientation layer since a

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dichroic molecular layer formed on the photoactive layer is anisotropically oriented (aligned) (column 2, lines 1-15).

Since Ichimura et al. teaches that a polarizer with the additional function of orientation is obtained by polymerizing the polymerizable mixture with a preferred orientation direction, it would have been obvious to have used the orientation photo-polymerization method of Ichimura et al. to polymerize the polymerizable mixture in the invention of Omelis et al. in order to obtain a polarizing optical element with orientation function capability.

7. Claims 8-10, 12-14, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Omelis et al. in view of Schadt et al.

Omelis et al. has been discussed above and teaches an optical film component polymerized from a polymerizable mixture comprising at least the following two components: (i) a liquid crystal monomer having cross-linkable groups and (ii) a photo-orientable monomer containing an azobenzene group.

Omelis et al. fails to teach the presence of other dichroic dyes and chiral additives in the polymerizable mixture, and to disclose the liquid crystalline phases of the liquid crystal monomer.

Schadt et al. teaches a polymerizable mixture of cross-linkable liquid crystal monomer which has acrylate or diacrylate components in the formation of a hybrid layer which is optically anisotropic (column 3, lines 15-65). Dichroic dyes are added to make an optical dichroic filter, polarizer or polarized light emitter (beam splitter). Chiral molecules are added to make an optical cholesteric (LC phase) filter or retarder (column 5, lines 5-25). Schadt et al. teaches the use of liquid crystals with nematic phase (twisted nematic effect) and with ferroelectric phase

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(ferroelectric effect) in order to obtain the respective electro-optical effects, all of which are well known. A conductive substrate (electrode layer) carries a layer of the polymerized mixture in an STN cell (column 7, lines 45-70). The film of crosslinked liquid crystal monomers has varying local orientation of the liquid crystal monomers (column 10, lines 15-20).

Since Schadt et al. teaches the addition of dichroic dyes to the polymerizable mixture to form an optical dichroic filter, polarizer or polarized light emitter, and the addition of chiral molecules to form an optical cholesteric (LC phase) filter or retarder, it would have been obvious to one of ordinary skill in the art to have used the additives taught by Schadt et al. in the polymerizable mixture of Omelis et al. in order to obtain the desired optical elements.

Since Schadt et al. teaches that the nematic and ferroelectric effects are well known in the art, it would have been obvious to one of ordinary skill in the art to have used liquid crystal monomers with the respective phases in the invention of Omelis in order to obtain the desired electro-optical effects.

8. Claims 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Omelis et al. in view of Akashi et al.

Omelis et al. has been discussed above and teaches an optical film component polymerized from a polymerizable mixture comprising at least the following two components: (i) a liquid crystal monomer having cross-linkable groups and (ii) a photo-orientable monomer containing an azobenzene group.

Omelis et al. however fails to teach the presence of fluorescent molecules.

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Akashi et al. teaches a liquid crystal display device (abstract) wherein the liquid crystal layer contains fluorescent molecules (dyes) to improve light scattering properties (column 5, lines 45-65).

Since Akashi et al. teaches that fluorescent molecules improve the light scattering properties of liquid crystal molecules, it would have been obvious to one of ordinary skill in the art to have used the fluorescent additives in the polymerizable mixture comprising liquid crystal molecules in the invention of Omelis et al. in order to obtain an optical element with the desired light scattering anisotropy.

Response to Arguments


9. Applicant's arguments with respect to claims 1-25 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number is (703)308-3265. The examiner can normally be reached Monday to Friday from 9:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (703)308-4251. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

SH
Sow-Fun Hon
09/26/03


HAROLD PYON
SUPERVISORY PATENT EXAMINER
1772

9/29/03